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REMARKS

Summary of the Office Action

Claims 1-8 and 12-14 have been rejected under 35 U.S.C. § 112, 2nd paragraph, as being indefinite.

Claims 1-8 and 12-14 stand rejected under 35 U.S.C. § 103 (a), as being unpatentable over U.S. Patent No. 4,976,582 to *Clavel* in view of U.S. Patent No. 4,695,181 to *Rahmede*.

Summary of the Response to the Office Action

Applicant proposes canceling claim 4, amending claims 1-3, 5-7 and 12-14. Accordingly, claims 1-3, 5-8 and 12-14 are pending for further consideration.

35 U.S.C. § 112, 2nd Paragraph Rejection

In the Office Action, claims 1-8 and 12-14 stand rejected under 35 U.S.C. § 112, 2nd paragraph, as being indefinite. Applicant proposes amending claims 1-3, 5-7 and 12-14 as shown above. These amendments have been made solely for purpose of clarifying the claim language, and not for purposes related to patentability.

Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1-8 and 12-14 under 35 U.S.C. § 112, 2nd paragraph.

All Claims are Allowable

Claims 1-8 and 12-14 stand rejected under 35 U.S.C. § 103 (a), as being unpatentable over U.S. Patent No. 4,976,582 to *Clavel* in view of U.S. Patent No. 4,695,181 to *Rahmede*. Applicant traverses this rejection for the following reasons.

With regard to independent claim 1, Applicant respectfully asserts that neither *Clavel* nor *Rahmede* teach or suggest an industrial robot including, "a bearing element ... [including] friction-increasing means in the form of grooves, the housing including a surface against which

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the bearing element abuts and the surface being provided with friction-increasing means in the form of complementary grooves engageable with the grooves provided on the bearing element to increase friction between the surface and the bearing element," as recited in independent claim 1.

Support for these limitations recited in claim 1 can be found at least on pages 3 and 4 of the originally filed specification, and in Figs. 1-3 and 5 of the originally filed drawings. Specifically, as shown in Fig. 5, the present invention discloses an industrial robot including at least one linkage device in which pull rods are arranged in a multi-joint system where the joints include three-axle ball and socket joints, such as the ones disclosed in Figs. 1-3. The ball and socket joints include a bearing element 3, which is fixed so as not to rotate in housing 2 of the socket joint. In order to increase the contact friction between surface 4 of housing 2 and bearing element 3, bearing element 3 may be provided with friction-increasing means in the form of grooves (see page 4, lines 4-8). These grooves on bearing element 3 may abut against surface 4 of housing 2, which also includes friction-increasing means in the form of complementary grooves engageable with the grooves provided on bearing element 3 to increase friction between surface 4 and bearing element 3 (see page 4, lines 4-8).

The Office Action cites *Clavel* and *Rahmede* as teaching or suggesting the invention recited in claims 1-8 and 12-14.

Specifically, *Clavel* discloses a standard robot including ball and socket type joints. As acknowledged in the Office Action, *Clavel* does not disclose the ball and socket joints including a bearing and friction-increasing means.

Rahmede, as illustrated in Figs. 5 and 8, discloses a ball joint including an inner bearing 21 which abuts against inner bottom 19 of joint housing 1. Inner bottom 19 includes elevations 20 such that inner bearing 21 is deformed into recesses 22 defined between elevations 20. This deformation prevents rotation of inner bearing 21 relative to joint housing 1. *Rahmede* however does not teach or suggest providing friction-increasing means, i.e. grooves, on both the bearing and the surface engaged with the bearing.

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Accordingly, *Clavel* and *Rahmede* clearly do not teach or suggest an industrial robot including, "a bearing element ... [including] friction-increasing means in the form of grooves, the housing including a surface against which the bearing element abuts and the surface being provided with friction-increasing means in the form of complementary grooves engageable with the grooves provided on the bearing element to increase friction between the surface and the bearing element," as recited in independent claim 1 of the present invention.

As pointed out in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim." "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Additionally, as pointed out in M.P.E.P. § 2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art". *In re Royka*, 409 F.2d 981, 180 USPQ 580 (CCPA 1974). Since these criteria have not been met, Applicant respectfully asserts that the rejection under 35 U.S.C. § 103 (a) should be withdrawn because *Clavel* and *Rahmede* do not teach or suggest each feature of independent claim 1.

In view of the above arguments, Applicant respectfully requests the rejection of independent claim 1 under 35 U.S.C. § 103 be withdrawn. Moreover, claims 2, 3 and 5-8, which depend from independent claim 1, are allowable at least because their base claim is allowable, as well as for the additional features recited therein.

Dependent claim 6

With regard to dependent claim 6, Applicant respectfully asserts that *Clavel* and *Rahmede* do not teach or suggest "the grooves provided on the bearing element and the surface are oriented primarily parallel with the central axis of the bearing element," as recited in claim 6, as amended.

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Specifically, Applicant notes that as shown in Fig. 3 of the present invention, grooves 5' are disclosed in a substantially parallel orientation. Compared to the curved grooves disclosed by *Rahmede* in Figs. 3, 7 and 8, the substantially parallel grooves 5' for the present invention provide for firm engagement between bearing element 3 and housing 2. Moreover, the substantially parallel grooves 5' allow bearing element 3 to be readily disengaged and replaced (see page 2, lines 25-26 and Fig. 3).

Applicant respectfully asserts that *Rahmede* lacks any such teaching or suggestion of parallel grooves.

Accordingly, Applicant respectfully requests the rejection of dependent claim 6 under 35 U.S.C. § 103 be withdrawn.

Independent claim 12

With regard to independent claim 12, Applicant respectfully asserts that *Clavel* and *Rahmede* do not teach or suggest a method for eliminating risk of play in a three-axle ball and socket joint in an industrial robot, "comprising the steps of ... providing the bearing element with friction-increasing means in the form of grooves, providing the housing with a surface against which the bearing element abuts, fixing the bearing element such that the bearing element does not rotate in the housing, the fixing step being effected by providing the surface with friction-increasing means in the form of complementary grooves engageable with the grooves provided on the bearing element, and engaging the friction-increasing means with the bearing element when the bearing element is positioned in place," as recited in claim 12, as amended.

Applicant respectfully asserts that claim 12 is allowable at least for the reasons presented above for the allowance of claim 1, and the additional features recited therein. In the interest of avoiding redundant arguments, reasons for the allowance of claim 12 are not repeated herein.

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In view of the above arguments, Applicant respectfully requests the rejection of independent claim 12 under 35 U.S.C. § 103 be withdrawn. Moreover, claims 13 and 14, which depend from independent claim 12, are allowable at least because their base claim is allowable, as well as for the additional features recited therein.

CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of the response, the Examiner is invited to contact the Applicant's undersigned representative to expedite prosecution.


If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 04-2223. If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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By:


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